



PATH ANALYSIS OF PARENTAL INVOLVEMENT AND CLASSROOM ENVIRONMENT ON STUDENT'S CRITICAL THINKING: ADAPTIVE MOTIVATIONAL FOUNDATION

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ABSTRACT

Education is an immense necessity for everyone. It develops us mentally and intellectually to overcome challenges with rational thoughts. To initiate such abilities, the role of parents and educators has been recognised as a significant factor for student's academic success. Hence, the present study aimed to examine the impact of parental involvement and classroom climate on student's critical thinking by using path analysis approach. The sample of 236 students of Class-XII standard was selected by simple random sampling for investigation. Parental Involvement Rating Scale (PIRS) developed by C. Naseema and A. Gafoor, Classroom Learning Environment Inventory by K.S. Misra and Critical Thinking Test constructed by researcher have been used for the collection of data. Product moment correlation coefficient was computed for analysis of data. SPSS AMOS was used to estimate the path coefficients to measure the magnitude of relationship between the predictor variables and criterion variable. The results reveal that there is a significant relationship between parental involvement and student's critical thinking. It also showed that there is a significant relationship between classroom learning environment and student's critical thinking. Further it recommended that the collective effort by parents and educators may cultivate an adoptive motivational foundation to enhance student's critical thinking skills.

KEYWORDS: Parental Involvement, Classroom Environment, Critical Thinking, Path Analysis.

INTRODUCTION

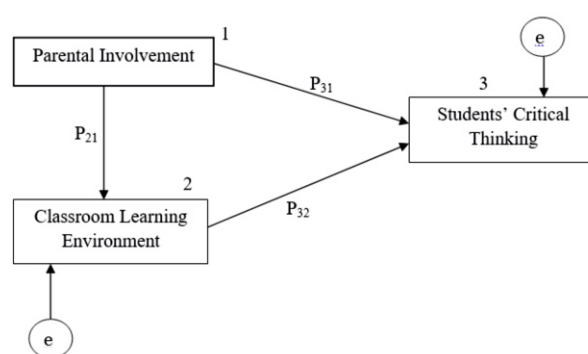
The major goal of education is to develop a child into well-integrated social person. The foundation of this developmental process starts from family at very young stage where the parents are the first educators of a child. The role of parents in their children's education has long been recognized as a significant factor in educational success and school improvement (Epstein 1996, Safran 1996). Thus, parental engagement in the effective and systematic education of the child plays crucial role for the cognitive development of child. Schiefelbaum and Simmons (2000) cited by Adell (2002) considered family background the most important and most weighty factor in determining the academic performance attained by the student. Hughes, Wikeley and Nash (1994) showed interesting insight into the notion of 'parents as consumers' where the parental attitudes and actions influence the children's performance at school. It has been observed that children who get help from their parents are more competent. It is believe that parental involvement in their children's learning makes them productive and achievers in the academics. Banoo (1982) studied parental involvement and its contribution to the education of child. The results revealed the significant relationship between the parental involvement and academic achievement scores after nullifying the effect of socio-economic status and intelligence. One of the key findings is that no matter how learning success is defined, parents can have a significant impact on their children's educational achievements (Harris and Goodall, 2009). Coon et al., (1993) found that parental Intelligence Quotient (IQ) influences child's achievement but both are linked mainly by School environment provided for the child. Along with parental support, classroom environments are extremely important for students and teachers. It is observed that if pupils have problems in social interaction in the school, the chances are that they are likely to be different in academic gains and achievement. Family involvement in schools is therefore central to improved student learning (The Australian Family-School Partnerships Framework, 2008). Many of the studies reflect that the role of parents and teachers is complementary to each other in the development of the child's thinking abilities. The parent involvement in education benefits not only the child but also parents and teachers.

In the present complex and rapidly changing world, it is necessary to integrate information from a variety of sources to make profitable decisions. Thus, it is important to prompt critical thinking of adolescents so that they can begin to reflect their own thought processes. Creating a positive classroom environment along with parental engagement with teaching practices encourage the students to think critically. Many of the studies on parental involvement carried out used only one criterion and predictor variables. To fulfill the purpose of present study, this is necessary to investigate the combined influence of variables on students' critical thinking. This study seeks to investigate the direct and indirect influence of parental involvement and classroom environment on students' critical thinking using path analysis approach.

Path analysis is a statistical technique used primarily to examine the comparative strength of direct and indirect relationship among variables. It consists of a family of models that describes the direct dependencies among a set of variables (Alwin, 1975). Path analysis was originally developed by geneticist Sewell Wright in the 1920s to examine the effects of hypothesized models in phylogenetic studies. Wrights analysis included writing a system of equations based on the correlations among variables influencing the outcome and then solving for the

unknown parameters in the model (Land, 1969). According to Wright, the path analytic method was intended to measure the direct effect along each separate path in such a system and finding the degree to which variation of a given effect is determined by each particular cause. It is considered closely related to multiple regression analysis. Heise (1975) described Path analysis as a subset of Structural Equation Modeling. It is a multivariate method for establishing the magnitude of influence of multiple presumed independent variables on one dependent variable. Path analysis framework is based on Path diagram (Path model) that shows the presumed causal relationships between three or more variables. The path model is a recursive model in which the direction of the causal flow is one way. A straight, single right pointing arrow represents a unidirectional causal relationship between the variables. Path model allows the investigation of direct and indirect predictors of a dependent variable. With the help of path model the direct and indirect effects of variables can be estimated. Thus researcher used the extended regression path model to represent the comparative strength of causal relationships among the variables.

For the present study, the concept of path analysis can best be explained with the help of a path model. A hypothesized causal model of the influence of parental involvement and classroom learning environment on students' critical thinking is shown below:



In the above path model direction of the arrows shows that parental involvement has direct effect on classroom environment of the child and the dependent variable – students' critical thinking. The model also shows that classroom environment has direct effect on students' critical thinking. The circles with letter 'e' represent error variables not included in the work but assume to be present. Path diagram shows the presumed causal relationships between three or more variables. The letter 'p' with two subscripts as indicated in the model is a symbol for path coefficients. The first subscript represents the dependent variable while the second subscript represents the independent variable.

Further it is necessary to investigate how the variables affect each other. The parental involvement (PI) includes nine elements i.e. parental acceptance (PAC), parental aspiration (PAS), parental attention (PAT), parental encouragement (PE), parental guidance (PG), parental influence (PIN), parental decision-making (PDM), parental provision of physical facilities (PPPF), parental care

(PC) to the physical fitness of child. It is believed that these variables also influence the students' critical thinking (CTS) separately either directly or indirectly. In a path model, a unidirectional causal relationship between variables is indicated by a straight, single right pointing arrow. So variables to the left of other variables are assumed to influence variables to their right. The path diagram in figure- 2 represents input model of the hypothesized relationship between the parental involvement (PI), classroom learning environment (CLE) and critical thinking of students (CTS).

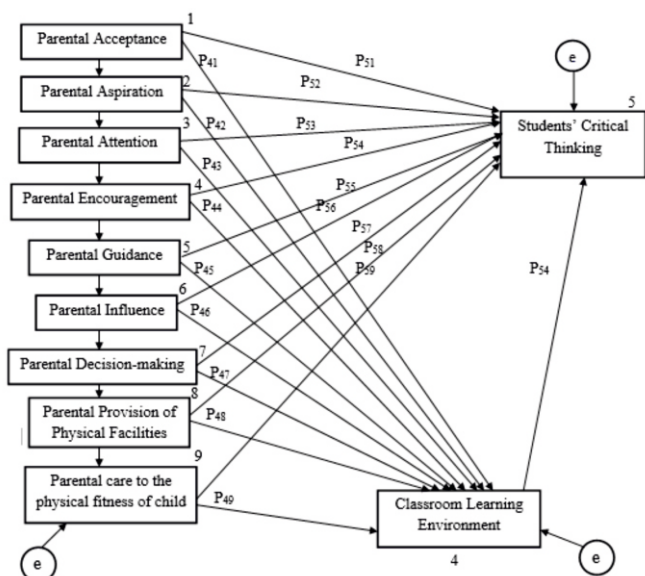


Fig. 2: Input Model of the hypothesized relationship between the variables

RESEARCH QUESTIONS

1. What is the relationship between the variables of parental involvement and students' critical thinking?
2. What is the proportion of variation in the students' critical thinking that is attributed to the predictor variables?
3. What are the direction and magnitude of the correlation coefficients among the variables in the path model?

METHODOLOGY

1. **Sample:** For the present study, data was collected randomly from CBSE affiliated schools of Allahabad city. The sample consists of 236 students of Class-XII including boys and girls.
2. **Tool selected for the study:** 'Parental Involvement Rating Scale (PIRS)' developed by C. Naseema and A. Gafoor, 'Classroom Learning Environment Inventory' by K.S. Misra and 'Critical Thinking Test' constructed by researcher have been used for the collection of data.
3. **Method:** Ex-post-facto method was adapted to study the cause and effect relationship among the variables and to determine the influence of independent variables on dependent variables.
4. **Statistical Technique:** Path analytic approach was employed to analyse the data.

ANALYSIS OF DATA AND RESULTS

The collected data was subjected to statistical analysis using AMOS (Analysis of Moment Structure). AMOS is a statistical software designed specifically for path analysis which is the extension of multiple regression method. The Correlation coefficient of .80 and above was regarded as high relationship, .30 to .79 was regarded as moderate relationship, .01 to .29 was regarded as low relationship and a correlation coefficient of .00 was regarded as no relationship, (Dowine and Heath, 1974 as cited Nworgu, 2006). The results of the study are presented below

Research Question

1. What is the relationship between the variables of parental involvement and students' critical thinking?

Table 1: Correlation Coefficient Matrix among the Predictor Variables

	CTS	PAC	PAS	PAT	PE	PG	PIN	PDM	PPPF	PC	CLE
CTS	1	.461(.21)	.527(.36)	.413(.39)	.600(.34)	.815(.58)	.632(.38)	.542(.31)	.457(.37)	.432(.27)	.581(.34)
PAC		1	.439(.28)	.735(.27)	.517(.43)	.621(.59)	.549(.45)	.637(.35)	.529(.43)	.461(.30)	.495(.41)
PAS			1	.531(.29)	.637(.51)	.467(.64)	.683(.38)	.534(.43)	.481(.52)	.529(.47)	.615(.25)
PAT				1	.746(.68)	.635(.42)	.521(.47)	.658(.51)	.643(.23)	.681(.39)	.510(.47)
PE					1	.619(.37)	.674(.23)	.597(.49)	.512(.35)	.759(.21)	.695(.53)
PG						1	.727(.53)	.632(.31)	.461(.40)	.651(.38)	.547(.25)
PIN							1	.715(.64)	.673(.57)	.734(.58)	.692(.33)
PDM								1	.547(.39)	.683(.39)	.525(.45)
PPPF									1	.793(.62)	.671(.43)
PC										1	.786(.61)
CLE											1

In the above table the value of correlation coefficient between parental guidance and students' critical thinking is 0.815. It results reveal that there is high relationship between parental guidance and students' critical thinking. The coefficient of determination associated with 0.815 is 0.58. The coefficient of determination (0.58) also known as the predictive value means that 58% of parental guidance is accounted for the variation in students' critical thinking skills. This is an indication that 42% of variation in students' critical thinking is attributed to other factors.

2. What is the proportion of variation in the students' critical thinking that is attributed to the predictor variables?

Table 2: Model Summary

model	R	R square	Adjusted R square	Std. Error of the Estimate
1	.649	.395	.381	0.598

- a. **Predictors (Constant):** Parental Acceptance, Parental Aspiration, Parental Attention, Parental Encouragement, Parental Guidance, Parental Influence, Parental decision-making, Parental provision of physical facilities, Parental care to the physical fitness of child and Classroom learning environment

This analysis was attempted to find the proportion of overall variance of students' critical thinking accounted by the variables in the path model. The above table reveals that the relationship of the predictor variables and the criterion variable is .649 and the coefficient of determination (R Square) is .395, this means that the model as a whole explained 39.5% of the total variance of students' critical thinking. The results showed that 39.5% of students' critical thinking is attributed by the predictor variables i.e. Parental Acceptance, Parental Aspiration, Parental Attention, Parental Encouragement, Parental Guidance, Parental Influence, Parental decision-making, Parental provision of physical facilities, Parental care to the physical fitness of child and classroom learning environment. This indicates that 60.5% of the variation in students' critical thinking is assigned to other factors not included in the model.

3. What are the direction and magnitude of the correlation coefficients among the variables in the path model?

The diagram shown below is an output path model. It represents the magnitude and directions of the correlation coefficient among the variables.

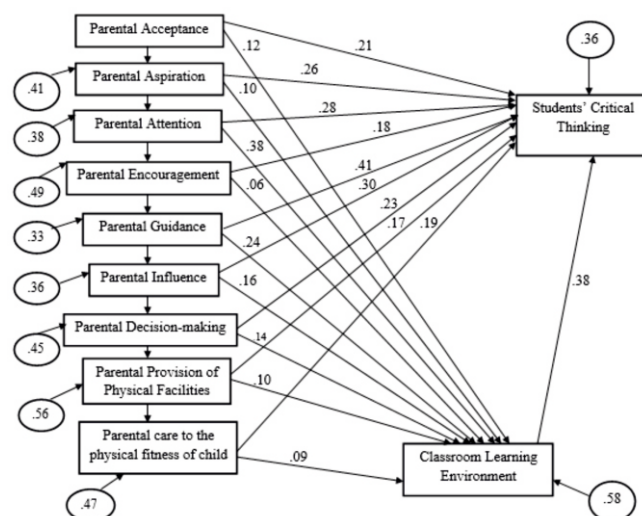


Fig.3: An Output Path Model to show the direction and magnitude of the Path Coefficients

In the above output path diagram, the coefficients of correlation reflect the strong causal effects between the predictor variables and criterion variable. The positive

path coefficient shows that there is no inverse relationship among the causal variables. This indicates a positive direction among all the causal variables. It is a common practice in path analysis that paths whose coefficients are below 0.05 or which do not reach some significant level should be deleted from the output path diagram as recommended by Kerlinger & Pedhazur (2009) and Garson (2011). Since, all the path coefficients in the above output path diagram are more than 0.05. Therefore, none of the path is deleted in the output diagram as all paths are important. This means that all the predictor variables positively influence the students' critical thinking either directly or indirectly.

DISCUSSIONS

The statistical analysis indicated that parental involvement encourages the development of children's critical thinking ability. Result on table 1 showed that the correlation coefficient between parental guidance and students' critical thinking was 0.815 and the associated coefficient of determination was 0.58. It indicates that 58% of parental guidance is accounted for the variation in students' critical thinking skills.

The correlation coefficients of the predictor variables as shown on table-1 provided the input data for assessing the predictive ability of the predictor variables of students' critical thinking. The path coefficients of the model proposed the suitability of the predictor variables in predicting students' critical thinking since no one path coefficient between two variables was less than 0.05. Thus, all predictor variables in the model were retained as predictors of students' critical thinking.

From figure-3, the path coefficient between parental acceptance and students' critical thinking was 0.21 which means that parental acceptance positively influence the students' critical thinking. Also, the path coefficient between parental aspiration and students' critical thinking was 0.26. It shows that parental acceptance and aspiration positively influences the students' critical thinking. This is an indication that parents' acceptance and aspiration are the predictor of students' critical thinking ($\beta > 0.05$). This implies that to some extent, the parental acceptance and aspiration contribute to the students' perception toward their parents' acceptance with the school related activities and the desires pursued by the parents through the education of the child. This finding is an agreement with Susan L. (2014) that parental acceptance to the child's interests with responses motivates their prompt and contingent learning abilities.

The correlation coefficient between parental attention and students' critical thinking was 0.413 and the coefficient of determination associated with the coefficient was 0.39. The output Path Model shows that the path coefficient between parental attention and students' critical thinking was .42. This implies that the parental attention moderately contribute to the development of students' critical thinking skills. This also indicates that parents' attention positively influences students' critical thinking by involving in the school activities. The finding of the study is consistent with Berger (1991) that parents' attention is considered a pathway through which schools enhance the achievement of underperforming children.

The path coefficient between parental encouragement and students' critical thinking was .18. This implies that the parental encouragement influences to the development of students' critical thinking. The correlation coefficient between parental encouragement and students' critical thinking was 0.600 and the associated coefficient of determination was 0.34. It shows a moderate causal effect of parental attention on critical thinking of students. The finding of the study is in agreement with the meta-analysis by Fan and Chen (2001) who found the moderate associations between parental encouragement and academic skills of students.

The finding of the study as presented on table 1 also showed that the correlation between parental guidance and students' critical thinking was positive and high i.e. 0.815. The coefficient of determination (.58) indicated that 58% of students' critical thinking is accounted by parental guidance. The path coefficient also showed that parental guidance has direct and significant positive effect ($\beta = 0.41$) on students' critical thinking. This finding is in agreement with the earlier findings by Gustafsson et al. (2011) who reported that parental expectations, guidance and the parents' function as role models are important mediating mechanisms to account for the effects of parental education on pupil's achievement. This explains why most children from good educational background of parents are able to perform better because of the guidance imparted by their parents. This finding showed that the responsive support of the parents works as a key for facilitating the pupil's cognitive development.

Parental influence and decision-making abilities in the output path model shows the moderate relationship with students' critical thinking. The correlation coefficient between parental influence and students' critical thinking was 0.632 and the coefficient of determination associated with the coefficient was 0.38 while correlation coefficient between parental decision-making and students' critical thinking was 0.542 and the associated coefficient of determination was 0.31. It means that the parental influence and decision-making abilities effect the development of students' critical thinking. Carl (2010) suggested that if we understand the role of parental closeness, the moral and decisions-making ability of children can promote easily.

The output Path Model shows that the path coefficient between parental provision of physical facilities and students' critical thinking was .17. From table-1, the correlation coefficient between parental provision of physical facilities and students' critical thinking was 0.457 and the coefficient of determination associated with the coefficient was 0.37. This represents positive moderate relationship between the parental provision of physical facilities and students' critical thinking. Also, the path coefficient between parental care to the physical fitness of child and critical thinking was 0.19 indicating that parental care to the physical fitness of child positively influences students' critical thinking. The path coefficient also showed a moderate causal effect of parental care on critical thinking of students. This finding is supported by Kate et al (2015) that parental encouragement and care on its own makes a difference in the amount of a child's physical activity. Intervening at schools and generating excitement about physical activity can help to develop children's cognition. Hence, Ogbemudia and Aiasa (2013) pointed that physical and psychological conditions of the home environment affect the children academically.

The finding of the study also revealed that there was a significant relationship between classroom learning environment and students' critical thinking. The path coefficient (0.38) showed that classroom learning environment has direct and significant positive impact on students' critical thinking. The correlation coefficient between classroom learning environment and students' critical thinking was 0.581 and coefficient of determination of associated with it was 0.34 indicated that 34% of students' critical thinking is accounted by classroom learning environment. This finding is consistent with the findings by Cooper (1995) who argues that in properly structured cooperative learning environment, students perform more of the active, critical thinking with continuous support and feedback from students and the teacher. Choy and Cheah (2009) suggested that consistent classroom activities by educators enhance the critical thinking of students. This explains that classroom learning environment influences students' critical thinking. This result demonstrated the importance of having educational and developmental resources in the classroom as well as the importance of teachers for students.

The results from output path model indicated the magnitude of all the predictor variables made a statistically significant contribution to the determination of students' critical thinking. In the order of rank, parental guidance has the highest contribution to students' critical thinking with a path coefficient of .409 followed by classroom learning environment with a path coefficient of .378. Parental influence made the third contribution with a path coefficient of .301 followed by parental attention with a path coefficient of .279. Parental aspiration made the fourth contribution with a path coefficient of .261 followed by parental decision-making with a path coefficient of .230. The path coefficient of parental acceptance was .211 followed by parental care to the physical fitness of child with a path coefficient of .189. Then, parental encouragement made the contributed a path coefficient of .180 and lastly parental provision of physical facilities with a path coefficient of .168. The coefficients of the output path diagram showed that parental guidance has the highest direct and significant positive effect on students' critical thinking. This finding revealed that parental guidance has great influence on students' critical thinking.

The unidirectional arrows (without origin) pointing to the latent factors of parental involvement, classroom learning environment and students' critical thinking represent unexplained (residual) variances for the eleven factors as shown by output path model. Result on figure 3 showed that 36% of the variation in students' critical thinking is unexplained while 64% of the variation in students' critical thinking is explained by its predictors i.e. Parental Acceptance, Parental Aspiration, Parental Attention, Parental Encouragement, Parental Guidance, Parental Influence, Parental decision-making, Parental provision of physical facilities, Parental care to the physical fitness of child and classroom learning environment. Also 58% of the variation in classroom learning environment is unexplained and only 42% is explained by the predictors of classroom learning environment.

Result also showed that 47% of the variation in Parental care is unexplained while 53% of this variation is explained by Parental provision of physical facilities, 56% of the variation in parental provision of physical facilities is unexplained by the model while 44% of the variation in parental provision of physical facilities is explained by parental decision-making. Meanwhile 45% of the variation in parental decision-making is unexplained while 55% of this variation is explained by parental influence, 36% of the variation in parental influence is unexplained by the model while 64% of the variation in parental guidance. Also, 33% of the variation in parental guidance is unexplained while 67% of this variation is explained by parental encouragement. 49% of the variation in parental encouragement is unexplained by the model while 51% of this variation is explained by parental attention. The output model also shows that 38% of the variation in parental attention is unexplained while 62% of this variation is explained by parental aspiration, 41% of the variation in parental aspiration is unexplained by the model while 59% of the variation in parental aspiration is explained by parental acceptance.

CONCLUSION

The findings of the study revealed that there was a significant relationship between students' critical thinking and the predictor variables of parental involvement. The findings also showed that classroom learning environment had

significant relationship with students' critical thinking. The output path diagram showed the path coefficients ranging from 0.09 to 0.41. This indicates that all paths are significant predictors of students' critical thinking. The variations in the magnitude of the path coefficients indicated the relative importance of each variable for the prediction of students' critical thinking.

SUGGESTIONS

Findings of the study showed that there was a high relationship between parental guidance and students' critical thinking. Therefore, parental support is a key for establishing effective interaction with children. Along with this parental attention is necessary to recognize the necessity of children and to develop self-awareness toward critical thinking. In schools, the teachers should encourage teaching practices to enhance critical thinking of the students in order to improve their problem-solving abilities. As the students happen to know more about importance of critical thinking skills, their academic achievement is likely to be higher. Parents should actively take part in the learning activities at school as well as at home to encourage the reflective thoughts.

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